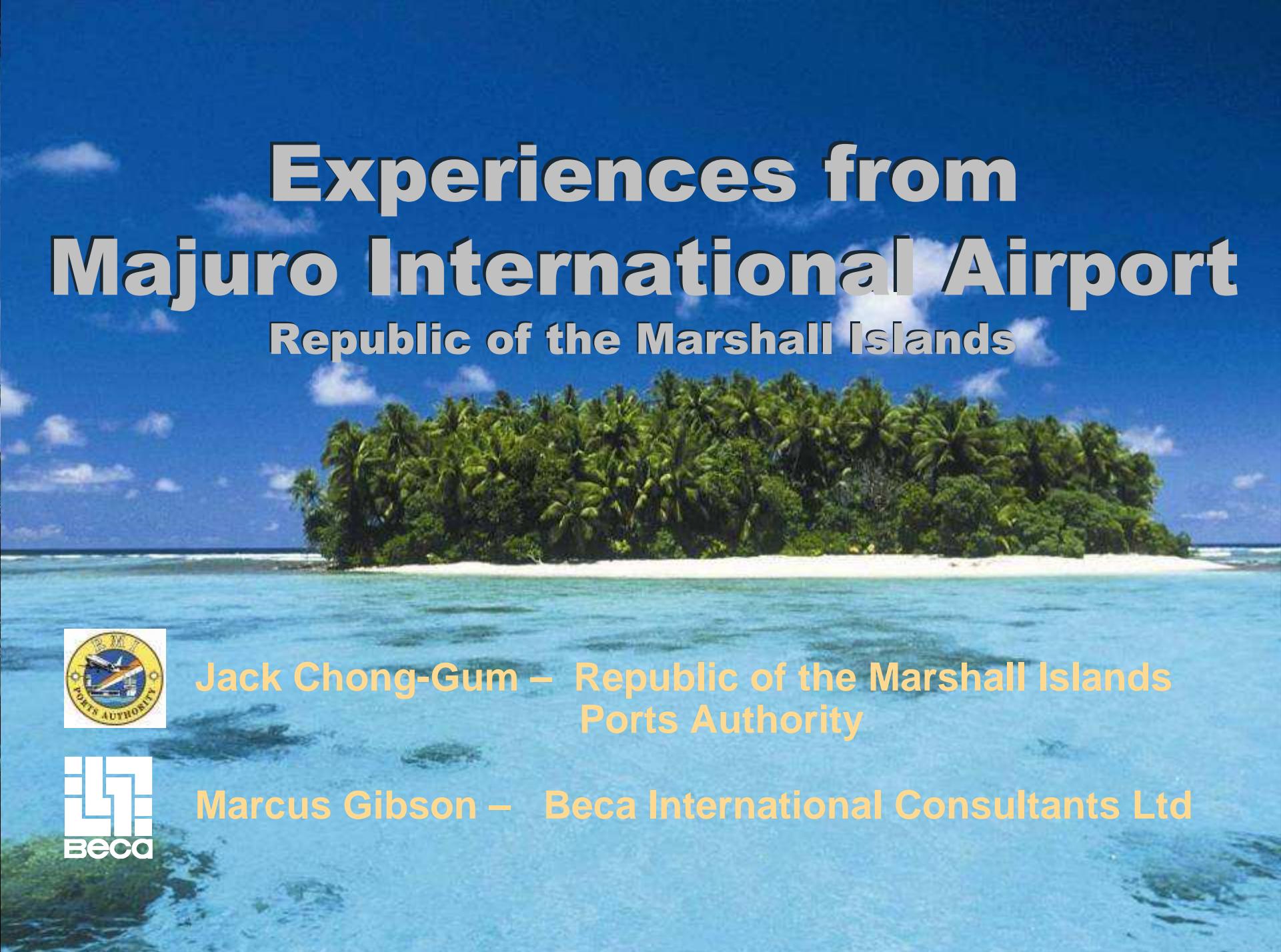


Case Study:

Unique Issues, Challenges & Needs of a Coral Atoll Airport in Operating and Achieving Safety Compliance

**FAA Western-Pacific Region
4th Annual Airports Conference
Westin Los Angeles Airport Hotel
Los Angeles - 6-8 May 2008**



Experiences from Majuro International Airport Republic of the Marshall Islands



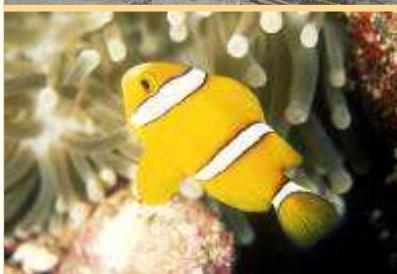
**Jack Chong-Gum – Republic of the Marshall Islands
Ports Authority**



Marcus Gibson – Beca International Consultants Ltd

Presentation Outline

- Presenting the Marshall Islands
- Challenges of Airport Operation
- Achieving Airport Safety Compliance
- Unique issues and challenges of implementation



A scenic view of a tropical beach under a bright blue sky with scattered white clouds. Several tall palm trees stand on the left, their fronds swaying slightly. In the middle ground, a small white boat floats on the calm, turquoise-colored water. The sandy beach curves along the bottom of the frame.

Presenting the Marshall Islands

Slide Show

Challenges of Airport Operation





Challenges facing a Coral Atoll Airport Operator

- Capital Improvement and Operational Funding
- Revenue Generation
 - Very low air carrier traffic
 - Very low passenger volumes
 - Insufficient to cover high operating and maintenance costs
- Airlines – Financial Stability
- Political Pressures



Challenges facing a Coral Atoll Airport Operator

- Harsh Environment Rapidly Degrades Improvements and Increases Maintenance Costs
- Limitations on Land Availability
 - Affecting operational clearances
 - Land availability for infrastructure development and airport equipment
 - Vehicle parking area by terminal building
- Limited Apron Area

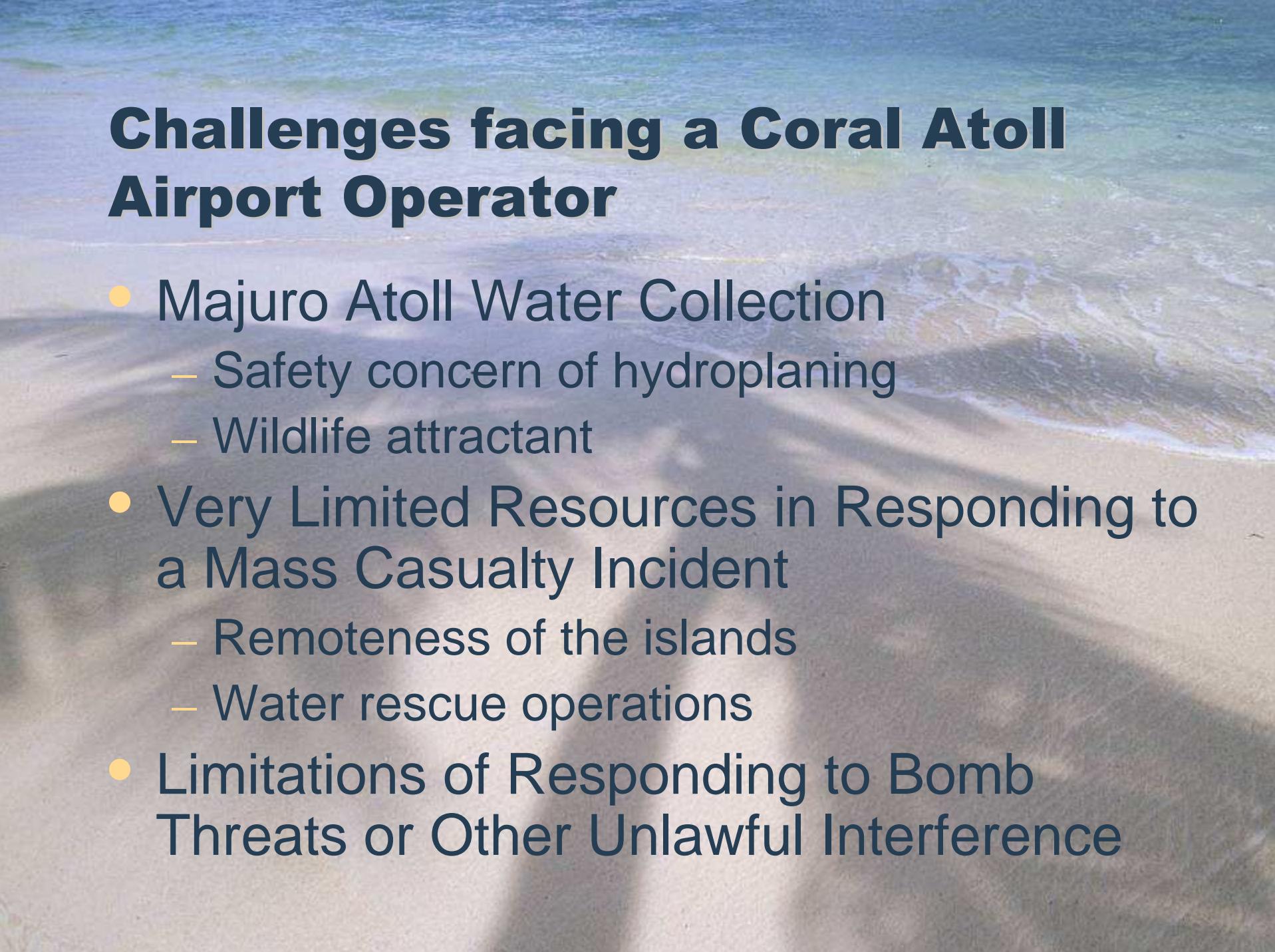
Apron Congestion





Challenges Facing a Coral Atoll Airport Operator

- Passenger Access to Aircraft
 - Lack of air bridges
 - Security concerns
- Security Requirements
 - Aircraft cabin inspections
 - Perimeter security fencing
 - Regulatory requirements
 - EDS equipment



Challenges facing a Coral Atoll Airport Operator

- Majuro Atoll Water Collection
 - Safety concern of hydroplaning
 - Wildlife attractant
- Very Limited Resources in Responding to a Mass Casualty Incident
 - Remoteness of the islands
 - Water rescue operations
- Limitations of Responding to Bomb Threats or Other Unlawful Interference



Challenges facing a Coral Atoll Airport Operator

- Limited Qualified/Experienced Personnel
- Customary Rights
- Storm Surges and Flooding of the Airport
- Complying with Safety Standards





A scenic tropical beach under a bright blue sky with scattered white clouds. Several tall palm trees stand on the sandy shore, leaning slightly towards the right. In the middle ground, a small white boat floats on the calm, turquoise-colored water. The horizon is visible in the distance.

Achieving Airport Safety Compliance



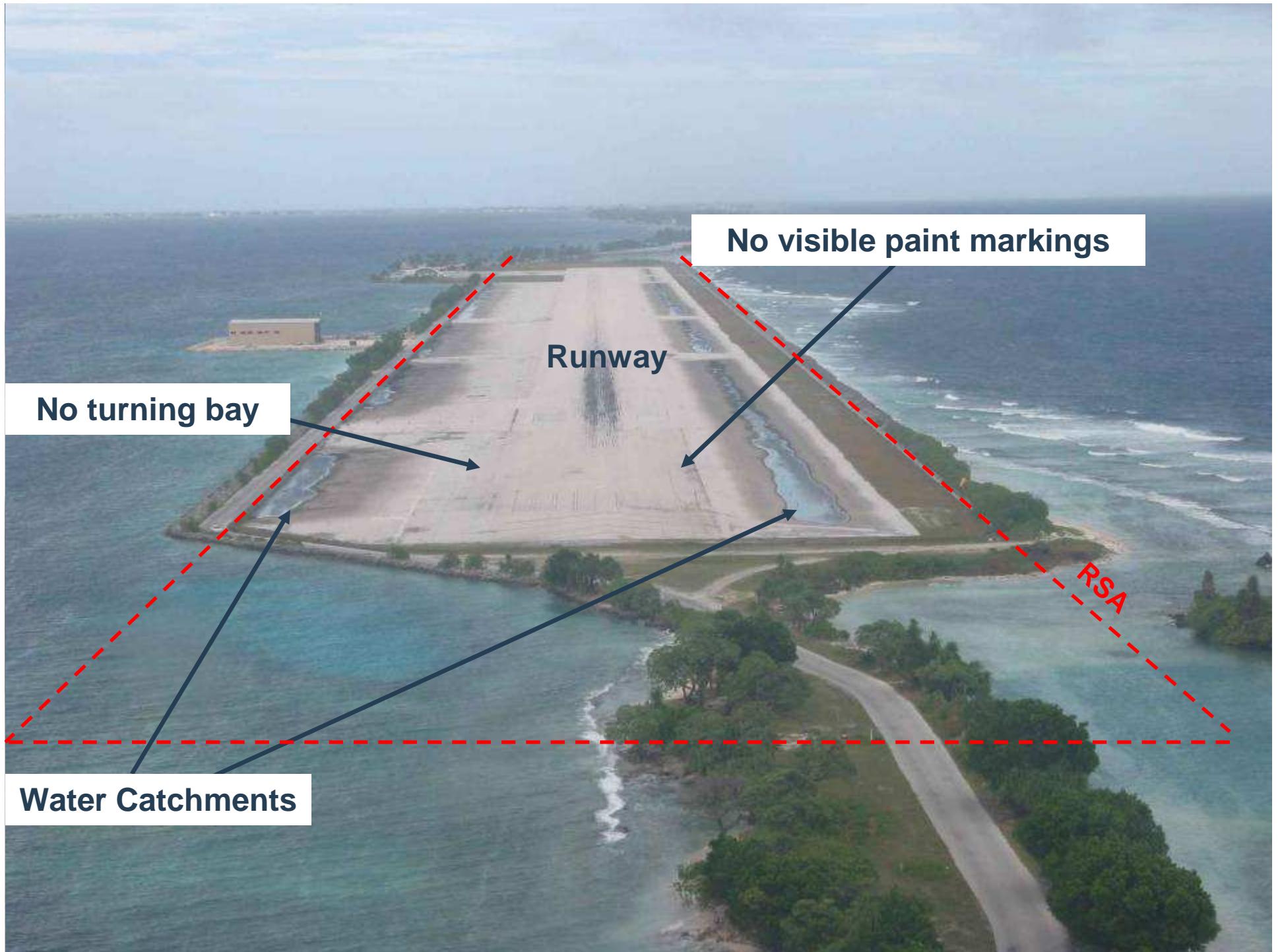
The road to achieve safety compliance

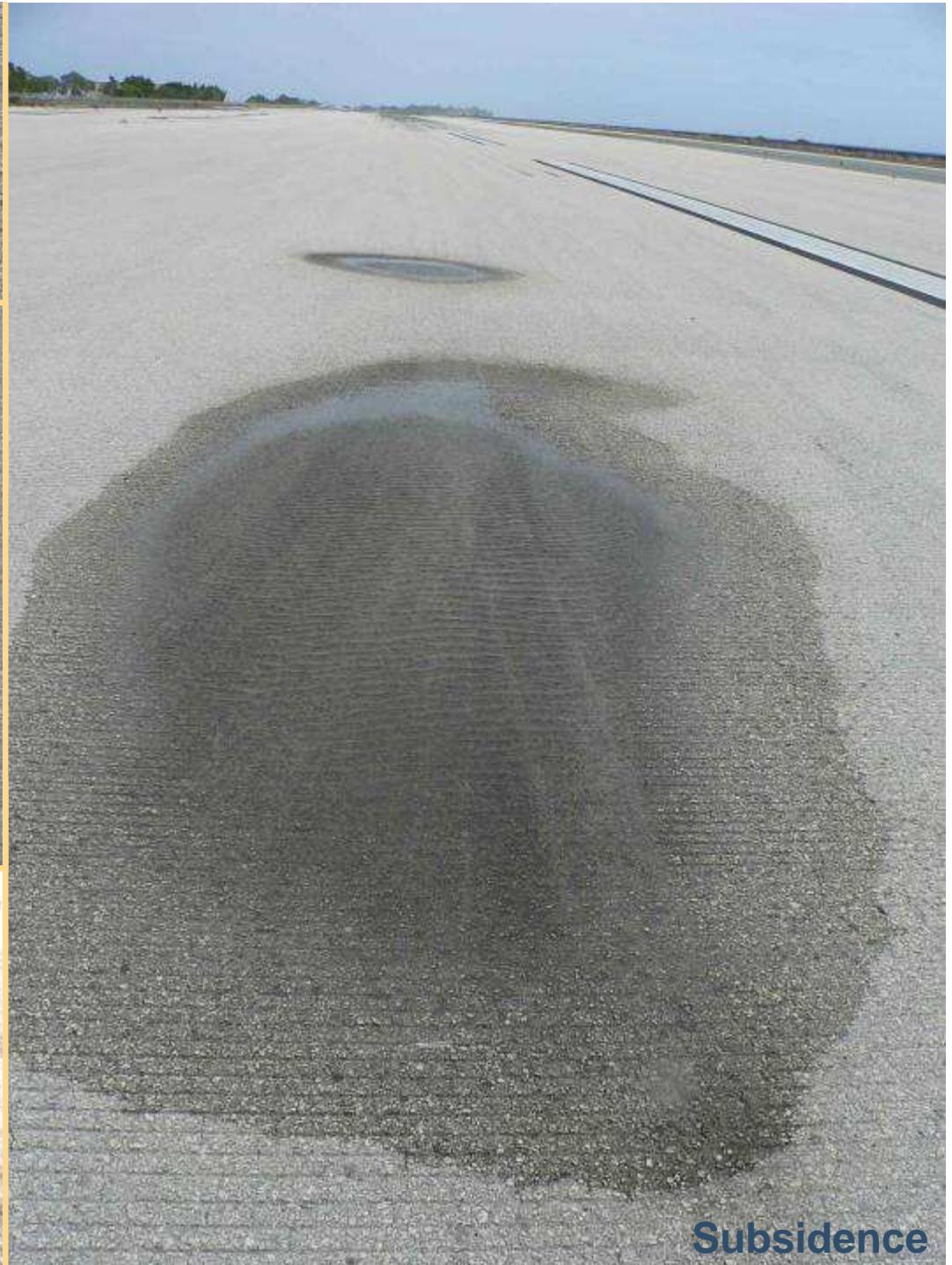
- Majuro Runway Upgrade Project - completed
- Majuro Apron Rehabilitation Project – in progress
- ARFF Personnel, Vehicles and Auxiliary Equipment – completed
- ARFF Building Project – in progress
- Airport Compliance Database – in progress
- Runway 07 RSA Improvement – conceptual planning

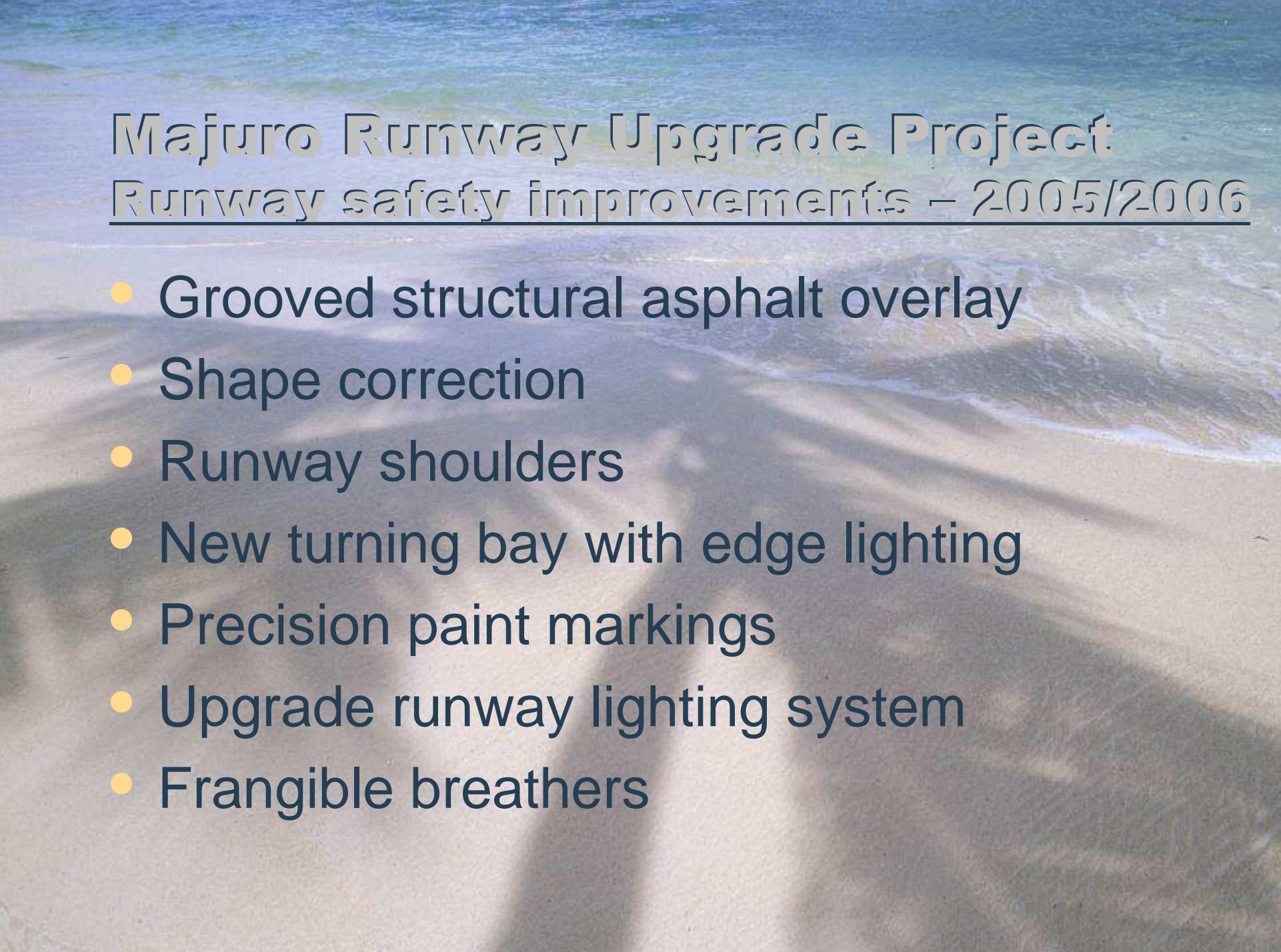
Majuro Runway Upgrade Project

Compliance issues

- Failure of the runway pavement
- FOD generation
- Limited visible paint markings
- No aircraft turning bay at Runway 07
- Runway lighting vulnerable
- Breathers within RSA not frangible







Majuro Runway Upgrade Project

Runway safety improvements – 2005/2006

- Grooved structural asphalt overlay
- Shape correction
- Runway shoulders
- New turning bay with edge lighting
- Precision paint markings
- Upgrade runway lighting system
- Frangible breathers



Completed Majuro Runway Upgrade









What an Improvement!!



Majuro Apron Rehabilitation Project

Compliance issues

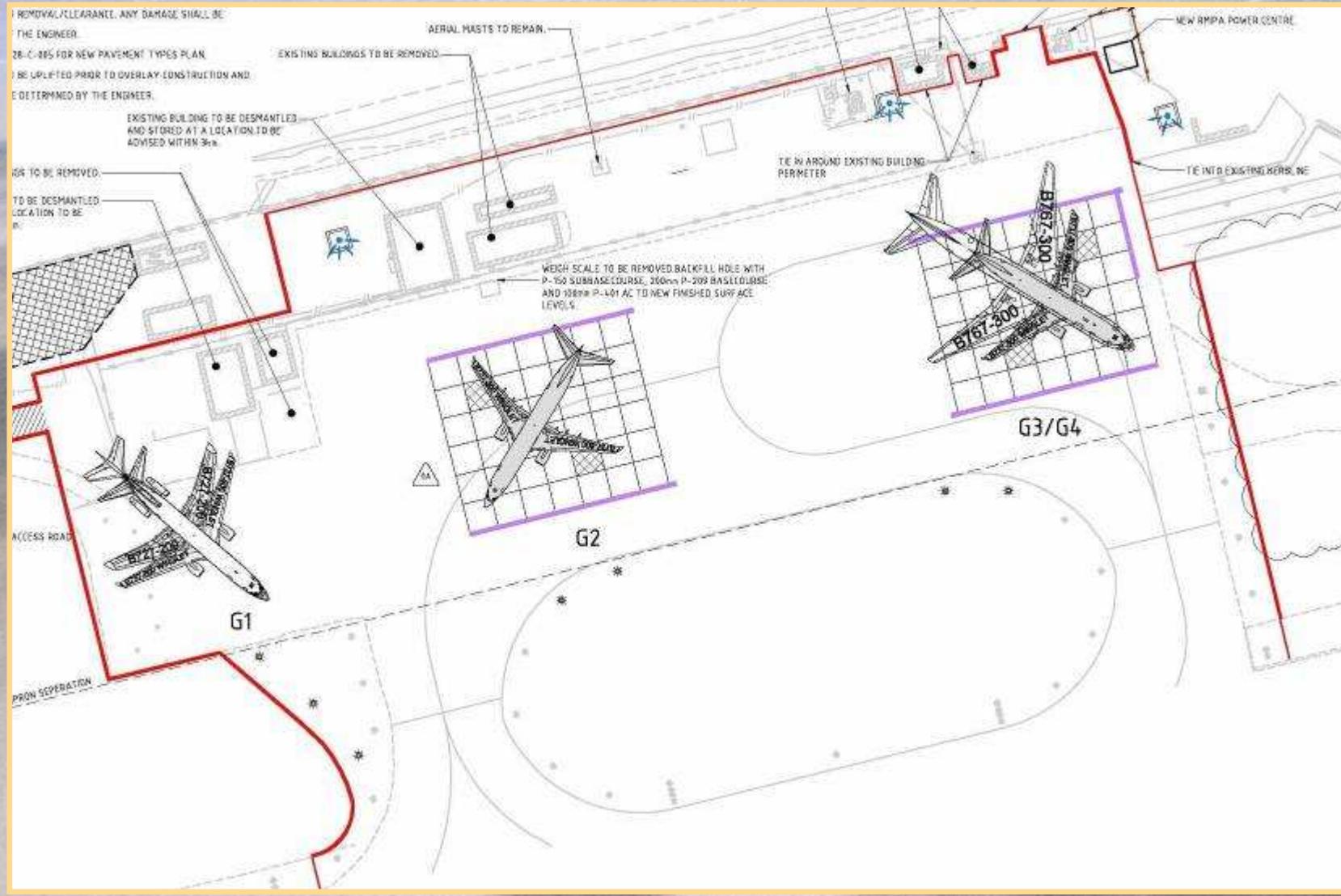
- Obstructions penetrating the FAR 77 transitional surfaces
- Apron congestion
- Mitigation of potential FOD
- No control/protection against jet blast
- Poor apron drainage
- Taxiway shoulders
- Substandard illumination
- Security fencing





Majuro Apron Rehabilitation Project

Apron safety improvements – 2007/2008



Majuro Apron Rehabilitation Project

Apron safety improvements – 2007/2008

- Three jet capable gates
- Asphalt overlay and concrete hardstands
- Minimise obstruction
- Apron floodlighting
- Improving apron drainage





- Additional fuel hydrants
- Signage and paint markings
- Blast/Security fence
- Backup power supply



ARFF Personnel, Vehicles & Equipment

Compliance issues

- Very old ARFF vehicles
 - Frequent breakdowns
 - High maintenance cost
- No airport firefighters
- Inadequate and worn out firefighting gears and equipment
- No training room for firefighters
- Very limited training in emergency response
- Limitations of re-servicing of ARFF vehicles



ARFF Personnel, Vehicles & Equipment

Safety improvements

- Two Oshkosh, 1500-gallon ARFF vehicles
- 11 ARFF Staff, Pro-Board certified
- New gears and auxiliary equipment
- Training room to be provided with ARFF bldg.



ARFF Personnel, Vehicles & Equipment

Safety improvements



- Airport emergency operations conducted by FAA, i.e. full-scale emergency exercise
- Foam supply provided with new ARFF trucks
- Water re-servicing capability with new ARFF building

ARFF Building Project

Compliance issues

- ARFF trucks parked outside
 - Rapid deterioration due to exposure to harsh environment
 - Note: temporary shelter built for new ARFF trucks
- ARFF equipment and tools stored in shipping containers
- No land available for a new building

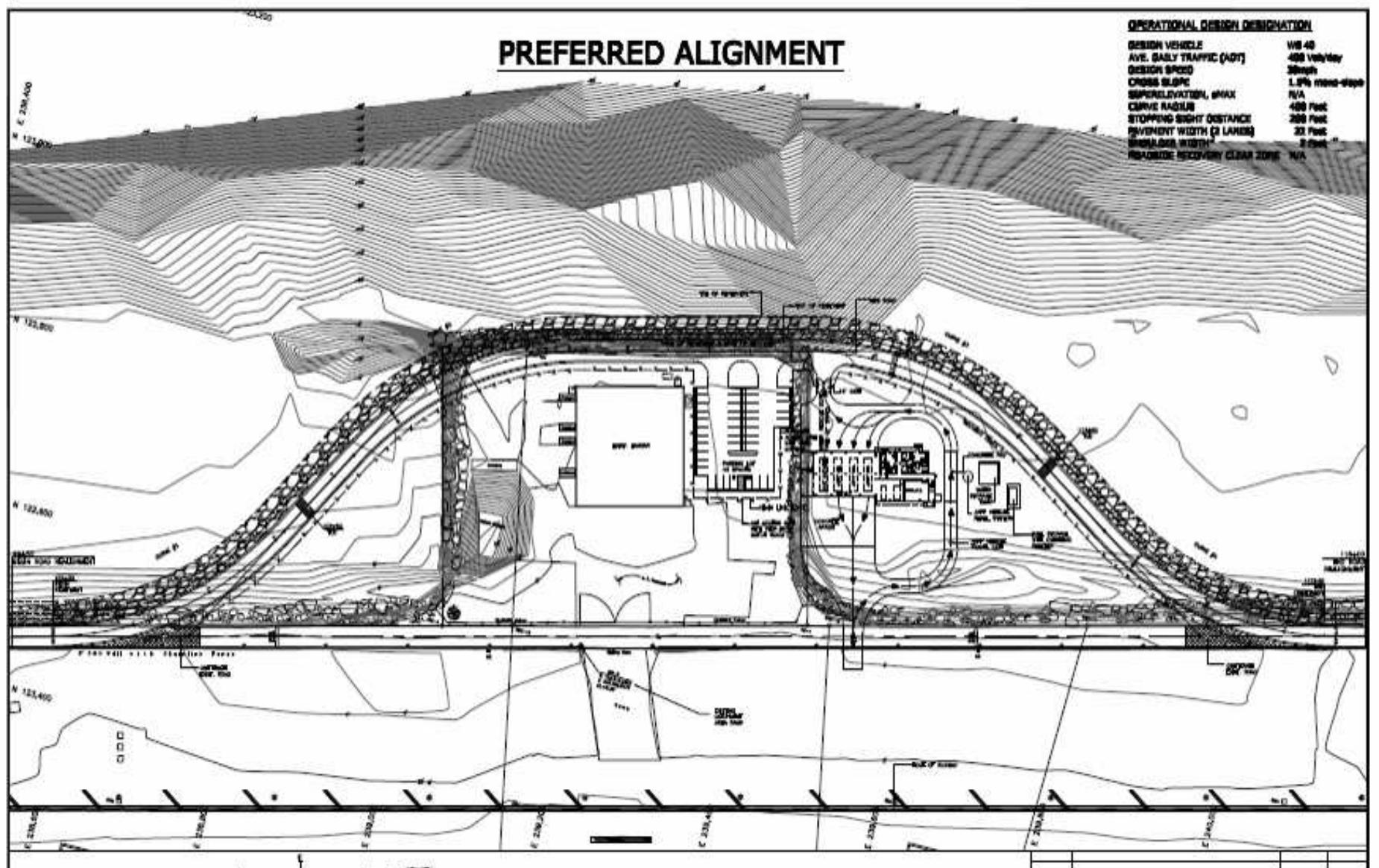
ARFF Building Project

Safety improvements

- Construct a new ARFF building
 - Equipped with four bays
 - Training and fitness rooms included
 - ARFF Dispatch/SAWRS offices
 - Located mid-point of runway
 - Water storage tank for re-servicing of ARFF vehicles
 - Accommodates future water rescue services
 - Site requires landfill



ARFF Building Project Safety improvements



Airport Compliance Database

Compliance issues

- Inconsistent self inspections
- No follow ups
- Lack of records/documentation
 - Uncertain if corrective actions are carried out

Safety improvements

- Consistent self inspections
- Records are maintained and readily available
- Management, user and public assurance
- Resourceful planning tool

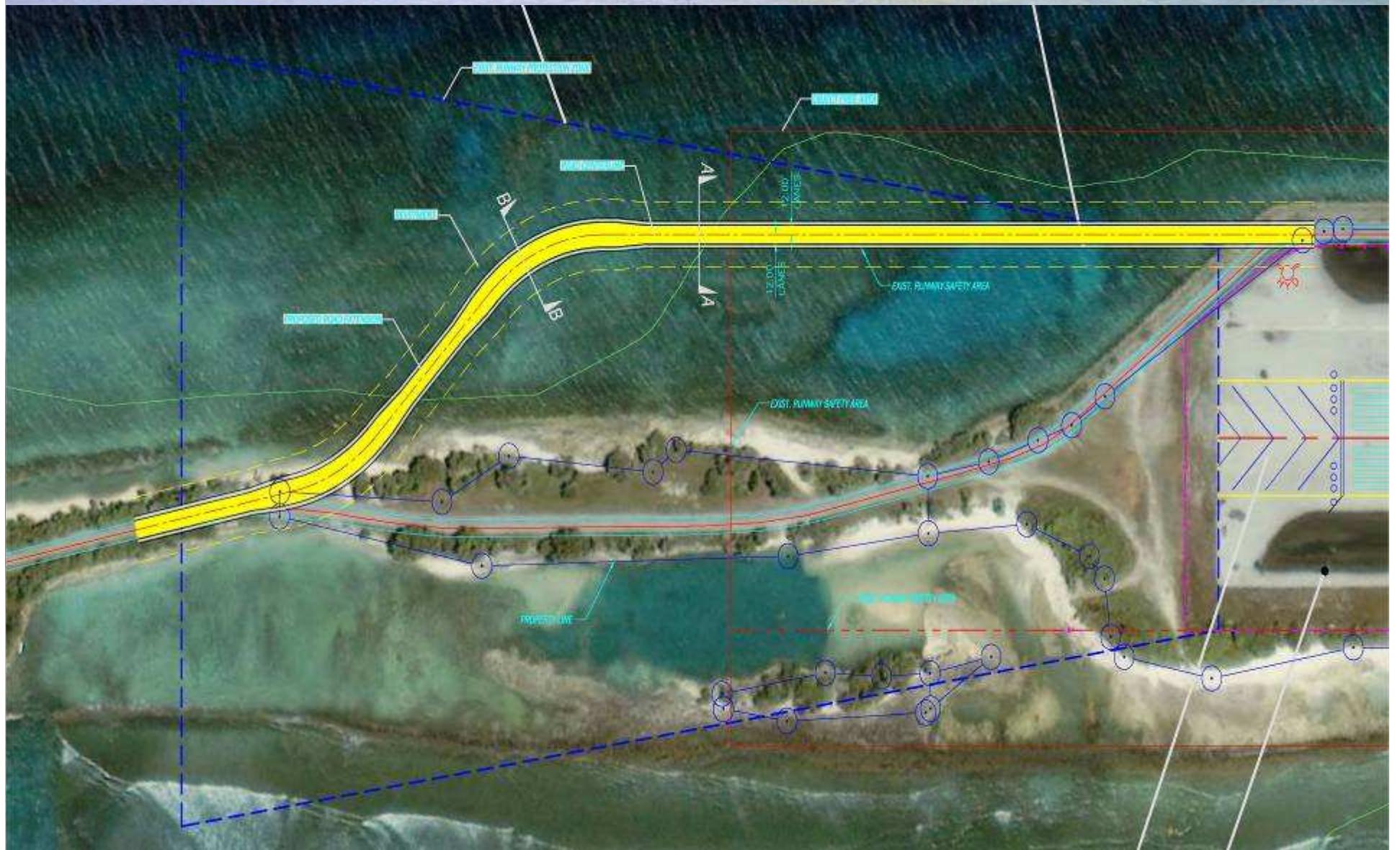
Runway 07 RSA Improvement Project

Compliance issues

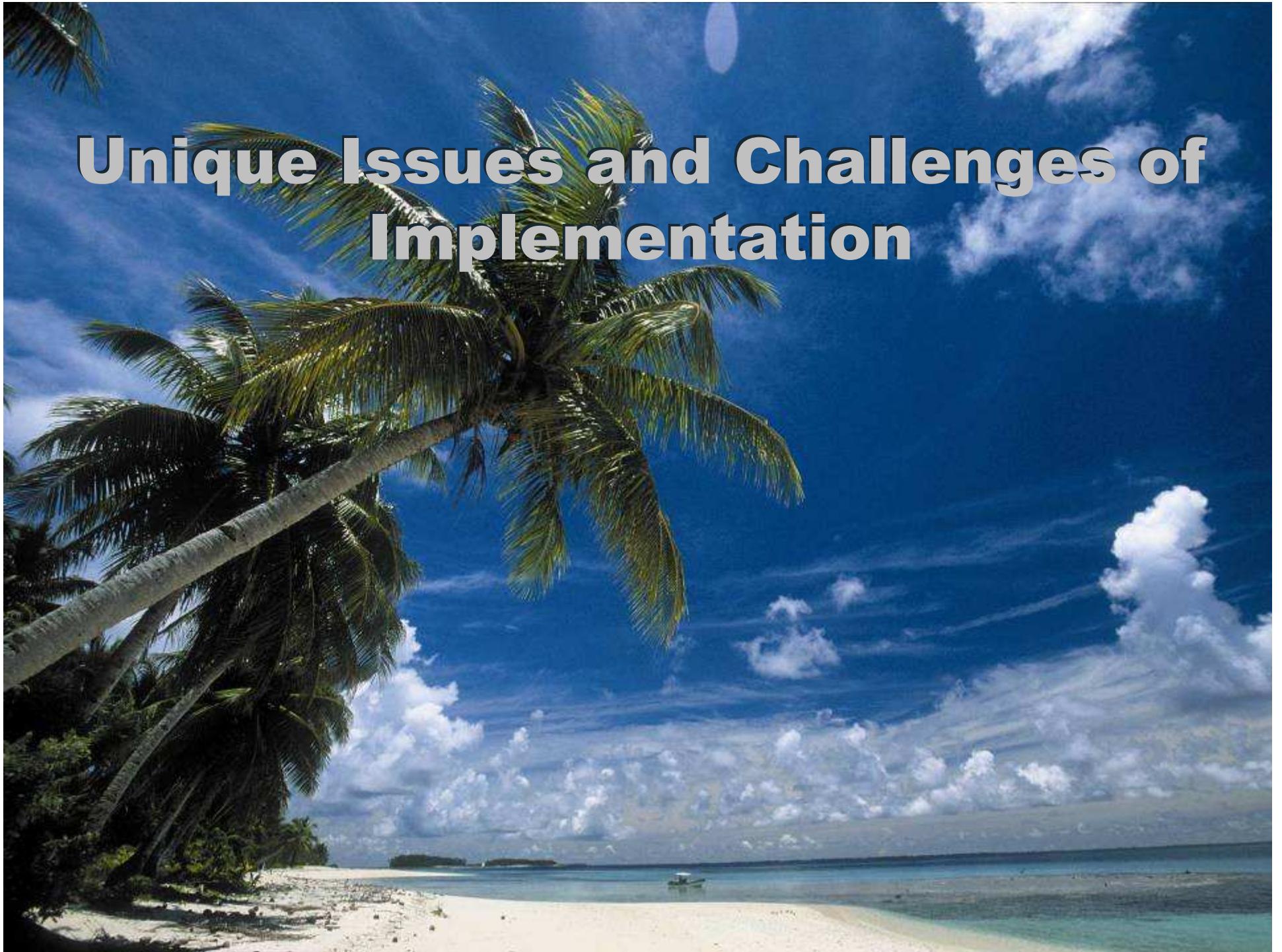
- No RSA at western end of runway
- Public road within RSA
- Portion of RSA used as a picnic area
- Public safety due to jet blasts
- Poor accessibility for ARFF equipment
- Below standard security perimeter fencing

Runway 07 RSA Improvement Project

Safety improvements



Unique Issues and Challenges of Implementation



Project Planning & Design

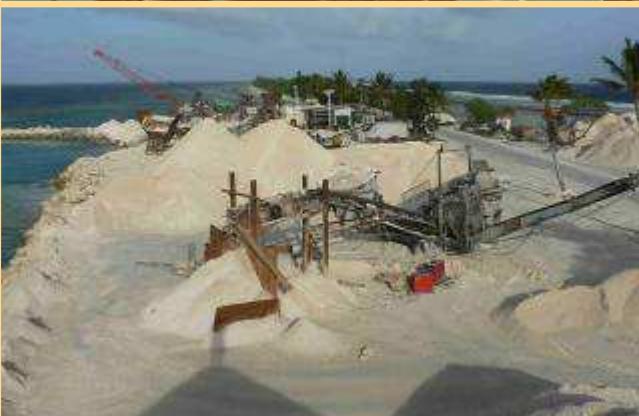


- Airport Master Plan
- Local preference
- FAA and government regulations
- Stainless steel/epoxy coated/fibreglass reinforcing bars
- Pavement testing
- Survey datum's
- Coral construction materials

Tendering – how to attract tenders?



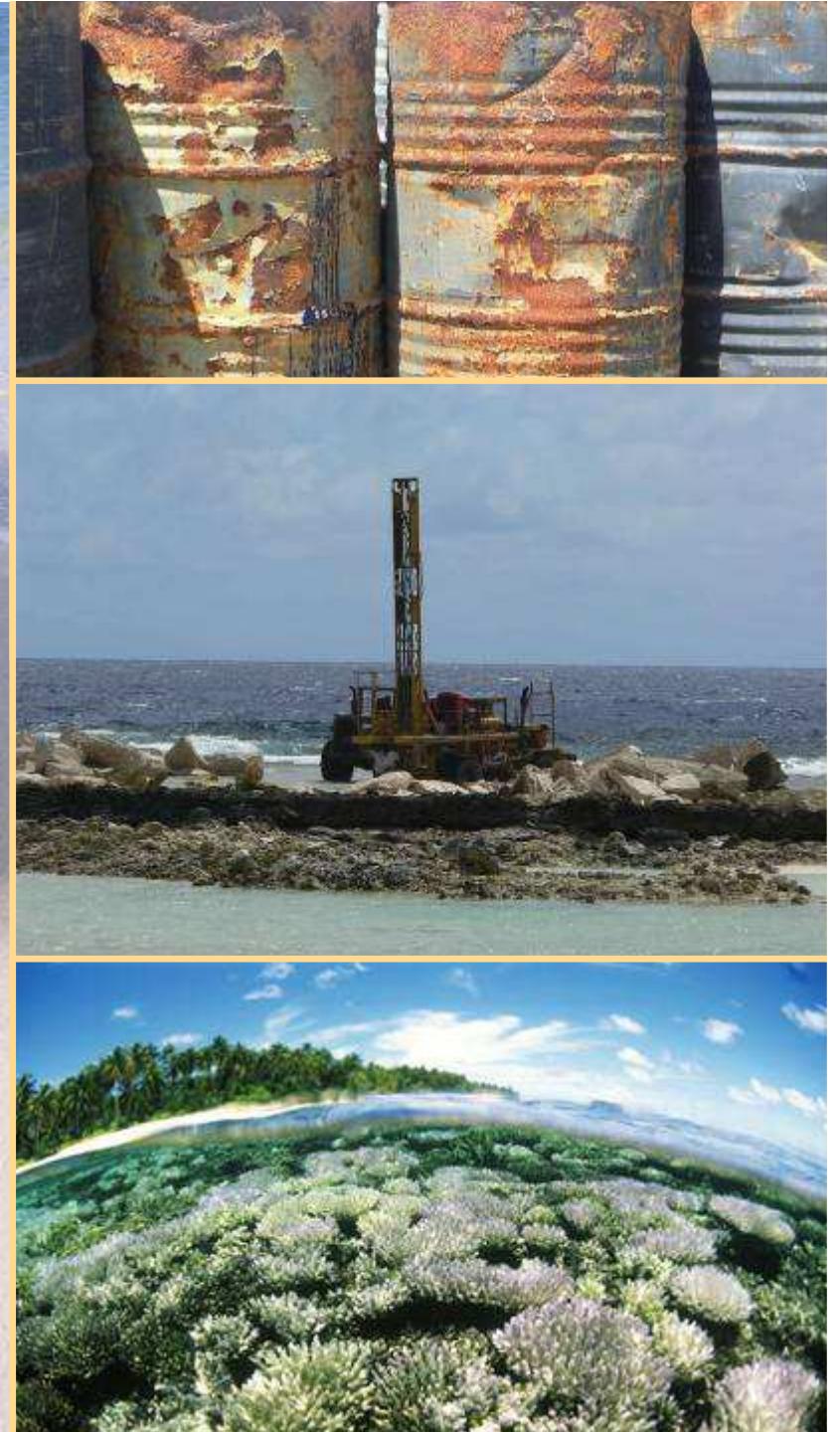
Construction Logistics



- High establishment costs
- Mobilize all specialist equipment
- Increased risk of delay
- Lay down space limited
- Fuel and water supply
- Laboratory certification
- Lack of local skilled labor
- Immigration

Majuro Environment

- Permitting
- Coral aggregates
- Fragile coral reef
- Construction waste
- Highly corrosive
- Humidity damage
- Flooding

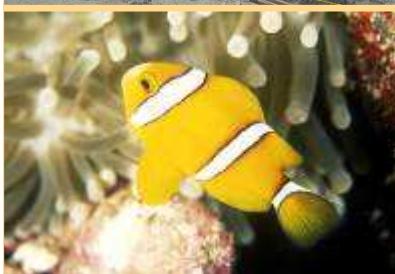




Tidal Groundwater Table

Summary

- Challenges of operating a coral atoll airport
- Compliance with safety standards on coral atoll airport has its unique issues and challenges
- Thanks to the FAA



KOMMOL TATA

Any Questions?

